

***FIRE WEATHER ANNUAL SUMMARY - 2003***  
***for***  
***EASTERN WASHINGTON and***  
***NORTHERN IDAHO***



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**National Weather Service**  
**Spokane , Washington**

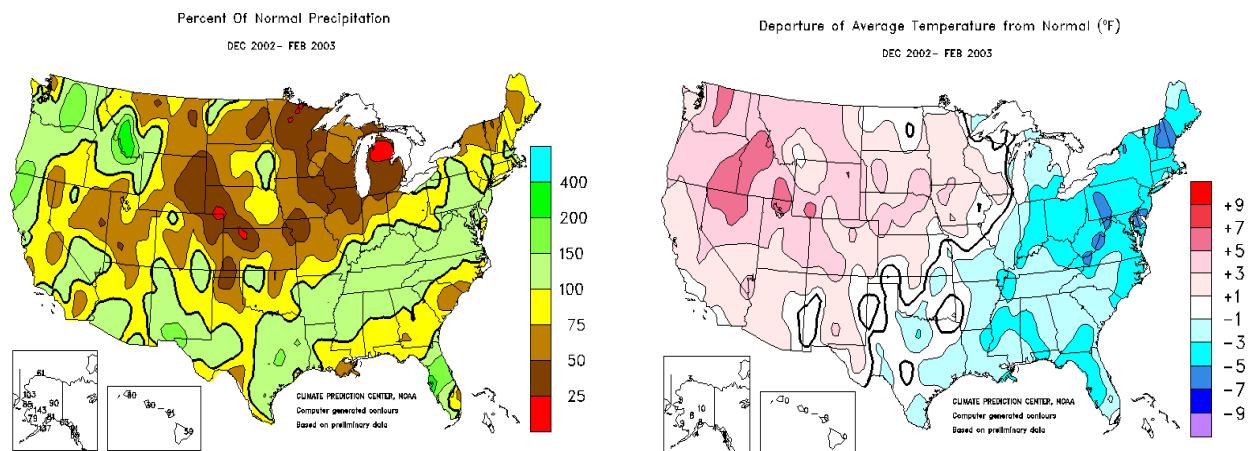
## Review of the 2003 Seasonal Weather

### **WINTER 2003**

The forecast for the winter of 2003 was for a mild winter due to El Nino. But the winter of 2003 was extremely mild. The average temperature in Spokane and Lewiston for the months of December and January was the 7<sup>th</sup> warmest ever, with records dating back to 1881. For Wenatchee, this winter was the 3<sup>rd</sup> mildest, but with records at Pangborn Airport only going back to 1959. Temperatures were above normal nearly every day in December and January. One of the stranger statistics of this winter is the fact that the coldest temperature for all 3 locations was set on Halloween of 2002, rather than the typical winter months.

Finally, with all the warm temperatures, snow was noticeably absent. The 21.2" of snow at Spokane was the least since the 1997-98 El Nino winter.

The first 10 days of December 2002 the region was under a ridge of high pressure. This resulted in widespread areas of low clouds and fog. But by the middle of the month the ridge broke down allowing a series of weak, warm weather systems to move through the Pacific. The end of December was dry and mild through Christmas. The year ended with some of the heaviest snow of the season. Average temperatures ranged from 4 to 6 degrees above normal. Total precipitation was above normal with most reporting stations averaging 150-200 percent of normal.



The wet weather continued into the first few days of 2003, but with warmer temperatures resulting in more rain than snow in the valleys. Another strong ridge of high pressure then developed, keeping the region dry for 2 weeks. A Canadian front sagged southward into the area on the 21<sup>st</sup> bringing some snow and rain to the area. This was followed by a stronger system that moved into the region from the west. Resulting in a brief second round of winter weather to the Inland Northwest. But a few days later a warm southerly flow brought record high

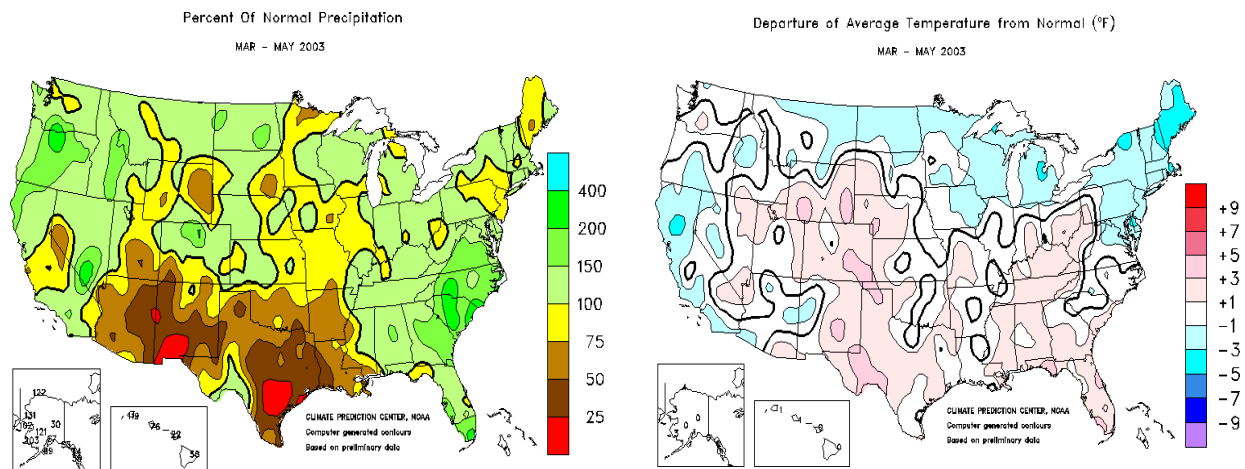
temperatures to the area.

After 2 wetter-than-normal months, the Inland Northwest dried out in February. A large high pressure ridge took a firm hold over the western US. The “storm door” opened briefly in the middle of the month for some modest precipitation, but overall the month of February was drier than normal. There were actually more colder-than-normal days in February than in December and January combined. The reason was a dry northerly flow kept the fog and low clouds away, especially at the end of the month.

## **SPRING 2003**

After our mild El Nino winter, the spring of 2003 was on the cool and wet side. March started off with a distinct cool spell, including some lowland snow in a few areas. Spokane airport picked up measurable snow on 3 of the first 9 days of the month, including a 1.2" snow fall on the 9<sup>th</sup>. But then the flow quickly switched to the southwest and temperatures warmed rapidly. On the 13<sup>th</sup> highs were in the mid 60s and even low 70s. The remainder of the month was a typical mixed-bag of weather. On the whole, March was a bit warmer than normal. Temperatures averaged 1-2 degrees above normal continuing the warm trend that existed since October 2002. Precipitation ranged from 55 percent of normal along the east slopes of the Cascades to 150-200 percent of normal across the Panhandle and eastern Washington.

That trend reversed for the remainder of the spring. April exhibited the normal spring pattern of quick warm spells followed by a cool showery period. The first 5 days were



cold, with lots of snow showers. On average measurable snow falls on Spokane in April only about once every 3 years. But recently it's happened 4 out of the last 7 years. The month ended with another cool spell. Wenatchee picked up 0.43" of rain on the 24<sup>th</sup>, which was nearly half of it's monthly total. Rainfall in April for most sites was 120-200 percent of normal. Temperatures for the month were 1-2 degrees below normal.

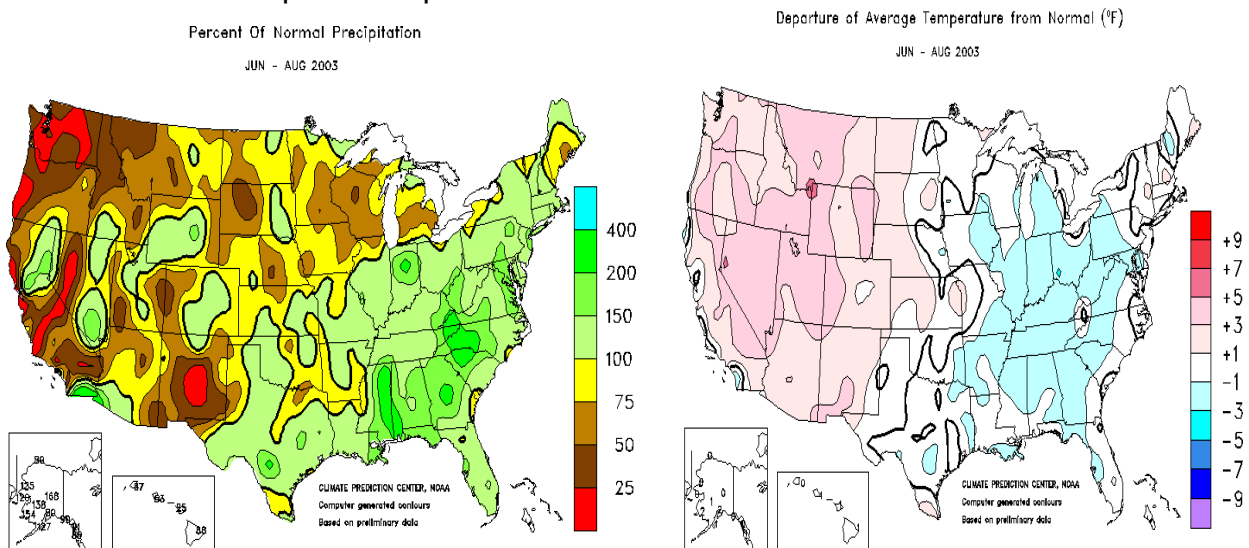
Cold spells throughout the first half of May were somewhat offset by a warm Memorial Day weekend. The coolest weather of the month was in the middle, with daytime

temperatures 10-15 degrees below normal. Lewiston topped out at 93 degrees and Spokane reached 91 on the 24<sup>th</sup>, which was about a 15 degree jump from the previous day. But this was just ahead of a Pacific cold front that was moving into the area. Severe thunderstorms occurred over the northeast part of Washington that evening. The weather then cooled considerably for the rest of the weekend. Overall temperatures in were .5-1.5 degrees cooler than normal. Precipitation was very variable across the region. Precipitation ranged from 20 percent of normal at Wenatchee to 126 percent of normal near the Blue Mountains.

## SUMMER 2003

Typically June is still a showery month in this area, as spring grudgingly gives way to summer. High pressure strengthened in the Gulf Alaska to start the month, while a series of low pressure systems dropped into the plains states. This allowed temperatures to slowly increase into the 80s and lower 90s. A strong storm system moved into the region on June 10<sup>th</sup> producing strong thunderstorms and severe hail. This was followed by a series of weather disturbances moving through the region about every 5-7 days. In between the temperatures would rebound back into the 80s and 90s. While these weather disturbances would cool off the temperatures, little precipitation was reported. Average temperatures were 2-4 degrees above normal and precipitation totals averaged only 10-20 percent of normal.

July began cool as the last of the weather disturbances moved through the region. High pressure then built into the western United States and remained over the 4-corners region through the month. Daytime temperatures warmed into the 90s and low 100s. A deep low pressure system slowly moved off the west coast around the middle of July. This resulted in ample subtropical moisture



moving up into the region and initiating both wet and dry thunderstorms, mainly in the

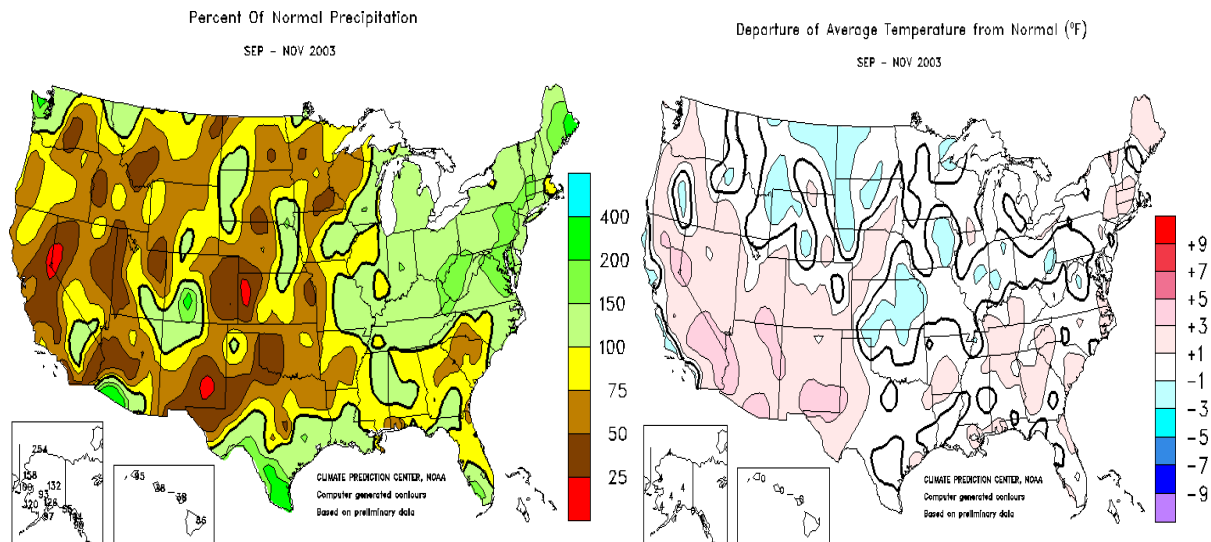
Oregon Cascades. Strong high pressure persisted the remainder of the month. Several weak storm systems tried to move into the region, but were sheared apart by the strength of the ridge. This allowed the weather to remain warm and very dry through the month with near record setting temperatures. Temperatures averaged 3-5 degrees above normal. Precipitation ranged from 0 percent across most of the region to 45 percent near the Blue mountains.

The warm dry weather continued into the first two days of August. A pair of weather disturbances moved out of Canada finally brought a few days relief from the 3<sup>rd</sup> through the 8<sup>th</sup> of August. Another deep low pressure system formed off the west coast and stagnated there through the 15<sup>th</sup>, before finally moving into British Columbia. While this brought slightly cooler temperatures only a light amount of precipitation was observed. High pressure again dominated the weather pattern to end the month with temperatures hovering around the 90 degree mark. Average temperatures were 1-3 degrees above normal. Precipitation, usually very dry in August anyway, ranged from 30-60 percent of normal.

## **FALL 2003**

September started on the hot side as high pressure remained over the western United States. Temperatures were in the 90s and to near 100 for most of the first week of the month. A strong windy cold front moved through the area on the 6th bringing some rain to the area and dropping temperatures 20-40 degrees. The cool temperatures remained through the third week of the month as series of week disturbances moved through the region.

One of the more unique things about September was the thunderstorms. Although they didn't bring much rain, thunderstorms rumbled through various locations in the Inland Northwest on several days, in a month that rarely sees any thunderstorms at all. The month ended with high pressure building back into the region briefly, before yet another weather system moved into the region. Even with the weather disturbances temperatures were 2-3 degrees above normal. Precipitation ranged from 0 percent along the east slopes of the Cascade mountains to 130 percent of normal near the Blue mountains.



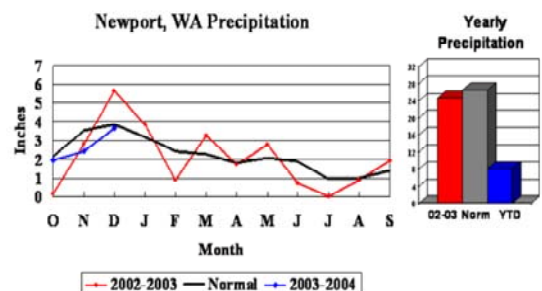
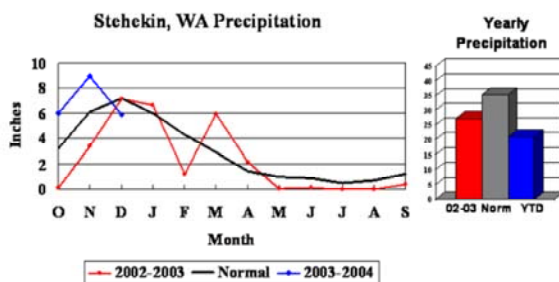
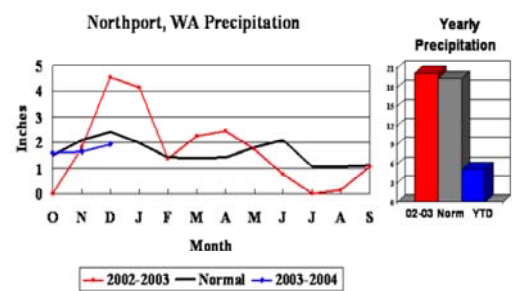
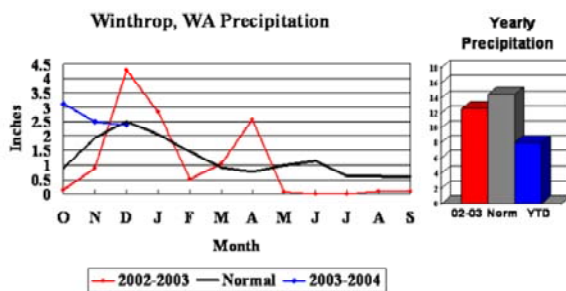
The warm weather at the end of September continued into October, with temperatures running 10-15 degrees above normal in the first week. Another warm spell occurred in the middle of the month. Lewiston hit 83 degrees on the 21st and 80 of the 22nd. Spokane hit 77 on the 21st. These were not only records for the day, but it was also the warmest it had ever been so late in the fall, with records going back to 1881. An extremely wet storm moved through the region on the 20<sup>th</sup>. While Seattle was shattering its 24-hour rainfall record, a near-record flood occurred on the Stehekin River along the east slopes of the Cascades. Stehekin picked up 4.51" of rain over a 2 day period. The month ended with a strong cold front from the northern Gulf of Alaska moving through the area. Wind gusts of 50-60 mph were recorded with a 94 mph gust recorded at the Oroville RAWS. Other wind reports included 61 mph at Douglas, WA, 60 mph at the Kettle Falls RAWS, 54 mph at Pullman, and 52 mph at Wenatchee. This front also spawned some thunderstorms, which is even rarer in October. October 2003 was on track for record warmth, but just like the previous year, a cold Canadian air mass moved into the area dropping temperatures to well below normal. Temperatures were 2-4 degrees above normal. Precipitation ranged from 30 percent of normal at Lewiston to 70 percent of normal at Wenatchee and 150 percent of normal near Stehekin.

November continued to see more active weather. The month started off very cold as a deep low pressure system remained over the western United States. Temperatures gradually rebounded to near normal. A wet storm system hit the area on the 8<sup>th</sup> and lingered over the region through the 10<sup>th</sup>. Mild weather returned for a week through the 17<sup>th</sup> of the month. Then a series of storms moved through the region. First a cold front stalled just off the coast. Copious amounts of moisture once again invaded the area from the southwest with another extremely heavy rain event in the Cascades. Stehekin received 5.20" in 2 days. Other reports included 4.50" at Lake Wenatchee, but only 0.01" at Wenatchee airport, demonstrating the strong rain shadow during this event. During this 48 hour period on the 18th and 19th, very strong winds blew over the remainder of eastern Washington and north Idaho. Wind gusts to 68 mph were

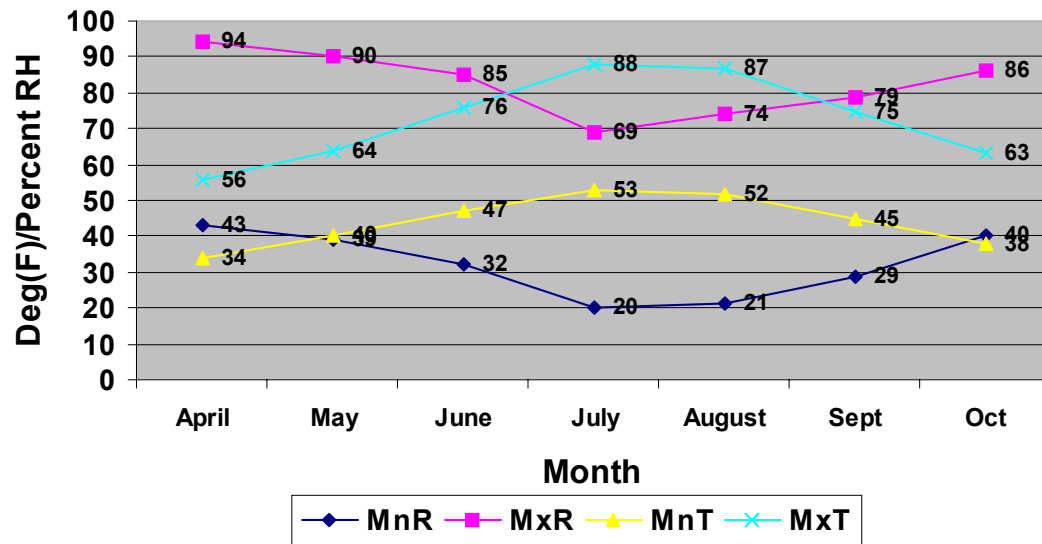


measured at Fairchild Air Force Base on the 19th before the cold front finally moved through. In its wake was a very cold and unstable atmosphere. A small-scale low pressure system moved into eastern Washington on the 20th and stalled over the area. Snowfall amounts of 8" were common with up to 13" reported. The snowfall was very localized with some locations receiving only a few inches. Temperatures were 2-6 degrees below normal for the month. Precipitation ranged from 30 percent of normal through the Columbia Basin to a 110 percent of normal along the Cascades.

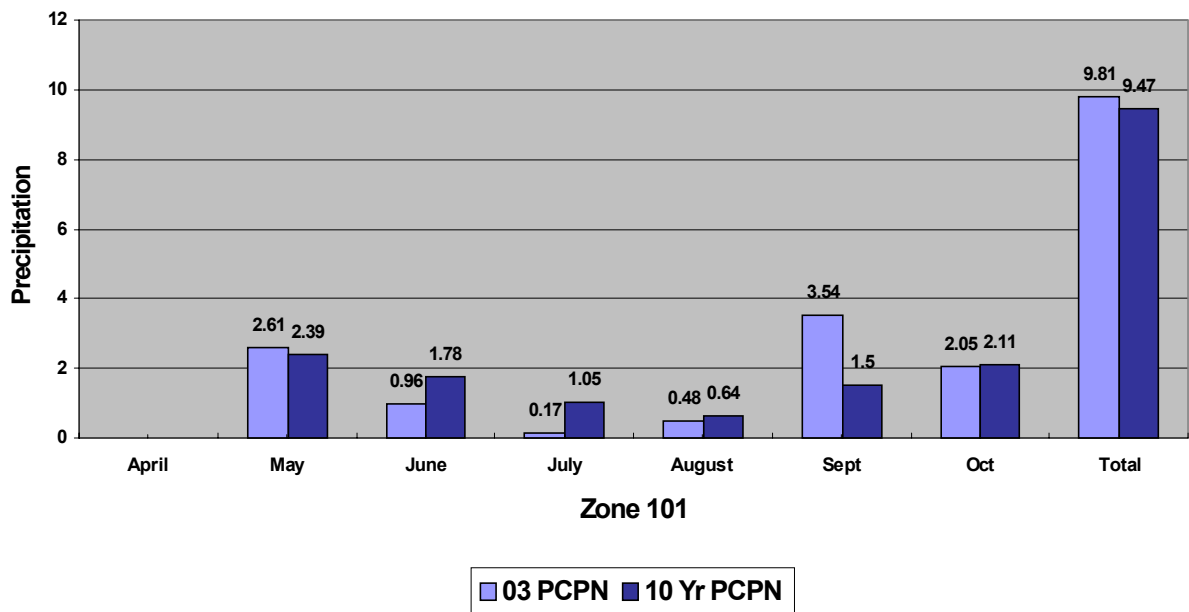
The one unmentioned fact in all this active weather was the continued drought. While some of the storms were rather spectacular, the day-to-day weather was on the dry side. The exception is in the Cascades where the heavy rain events have them well ahead of normal.



## 2003 Zone 101 Averages

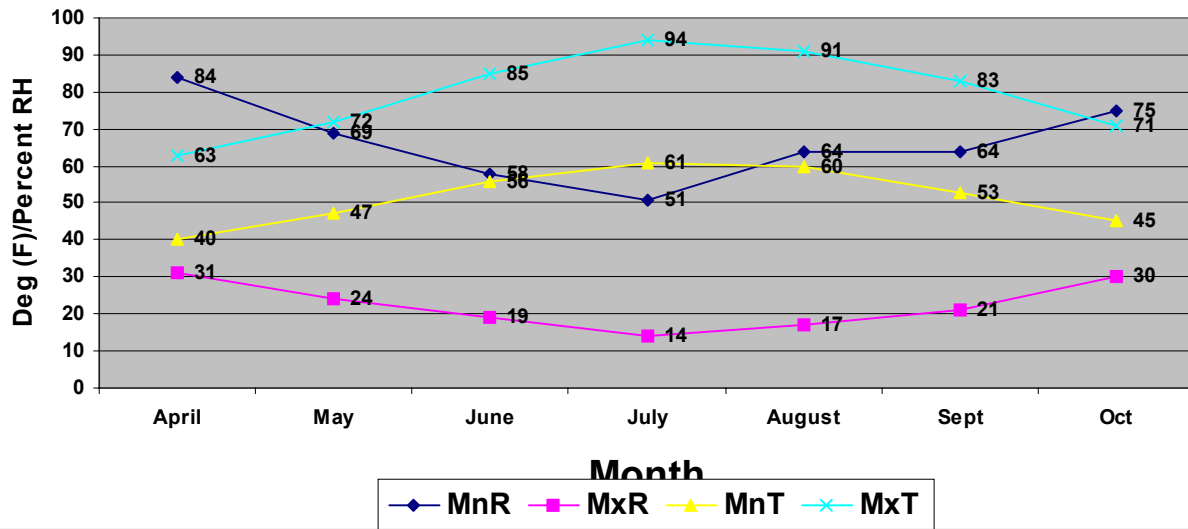


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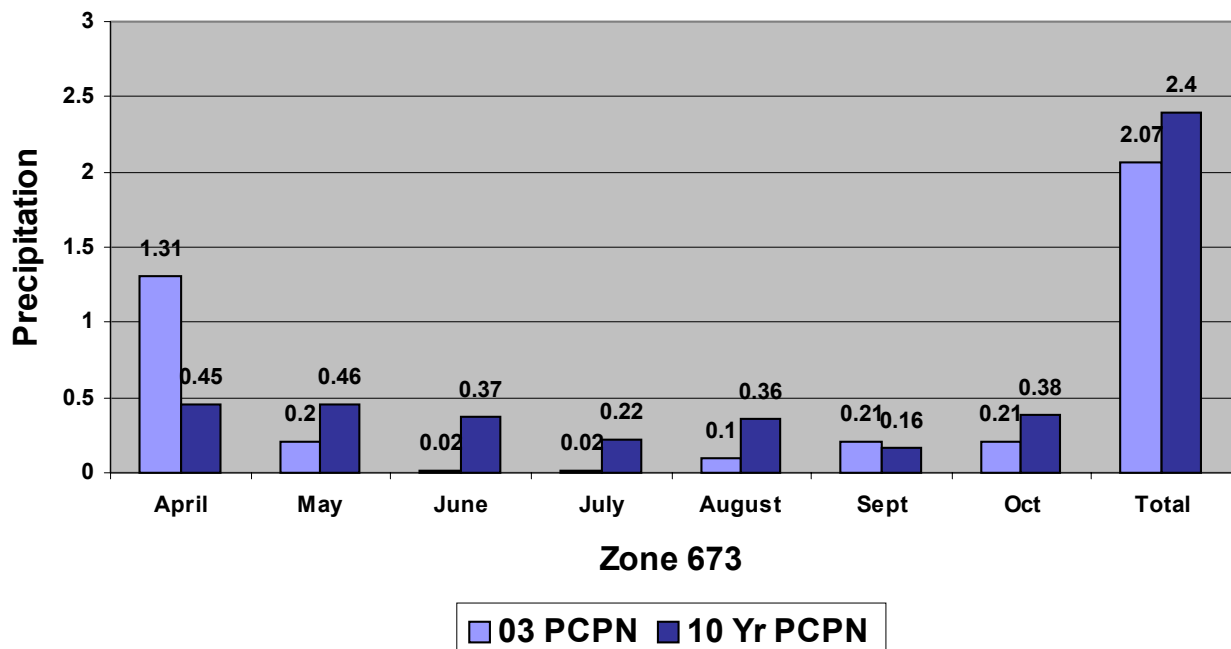




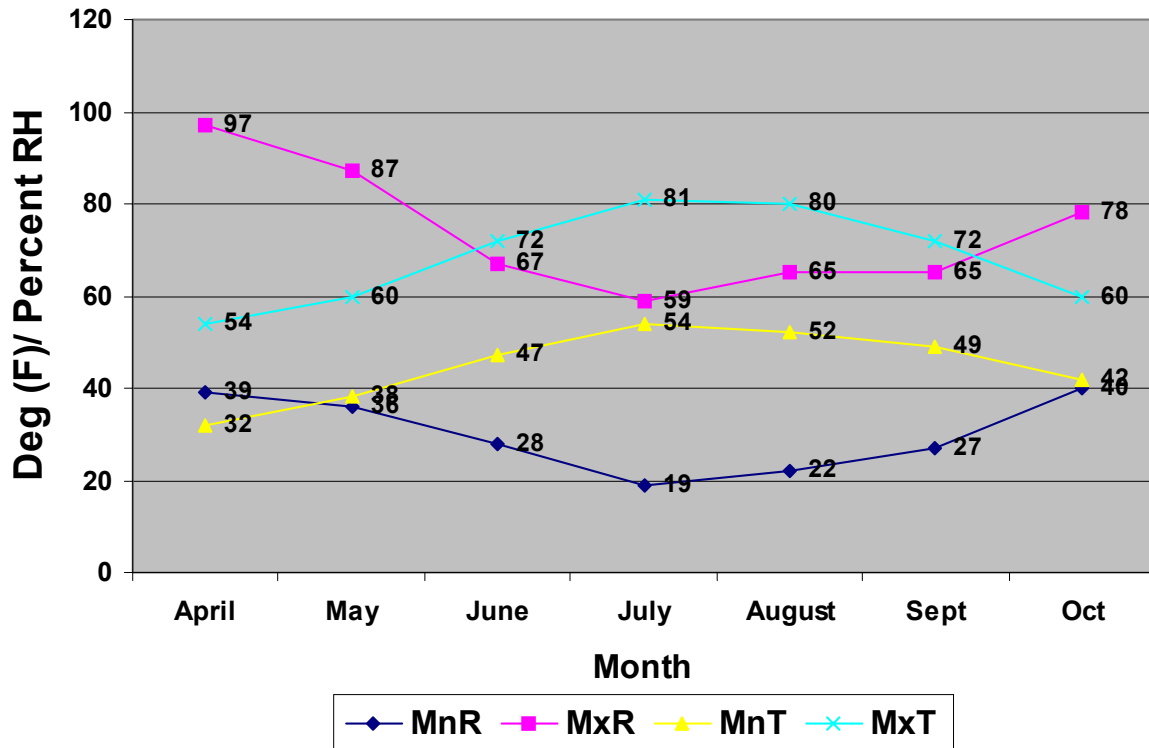
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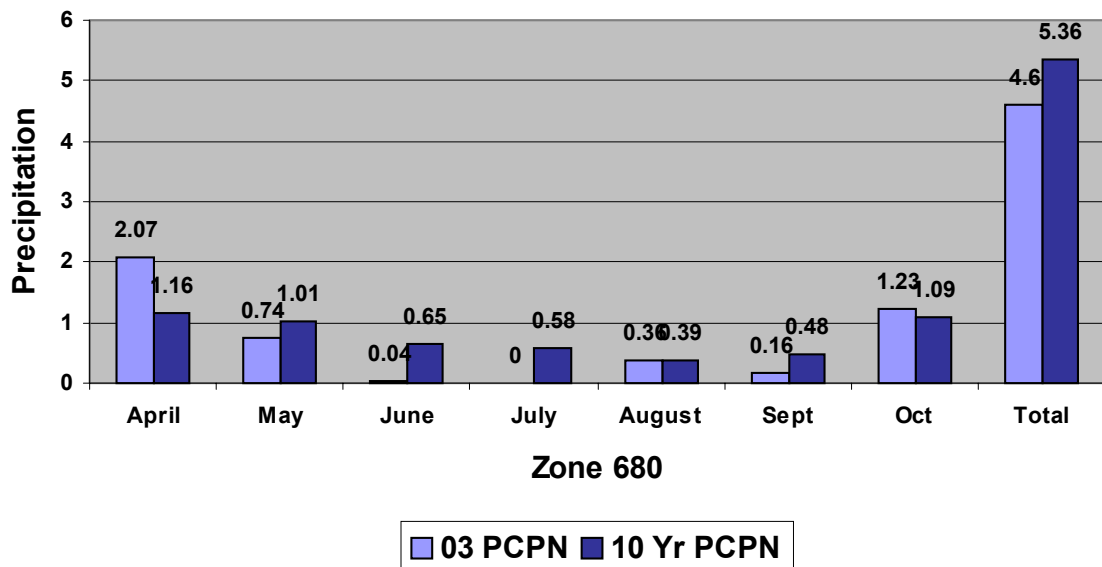
### 2003 Avg Pcpn/ 10 Yr Avg



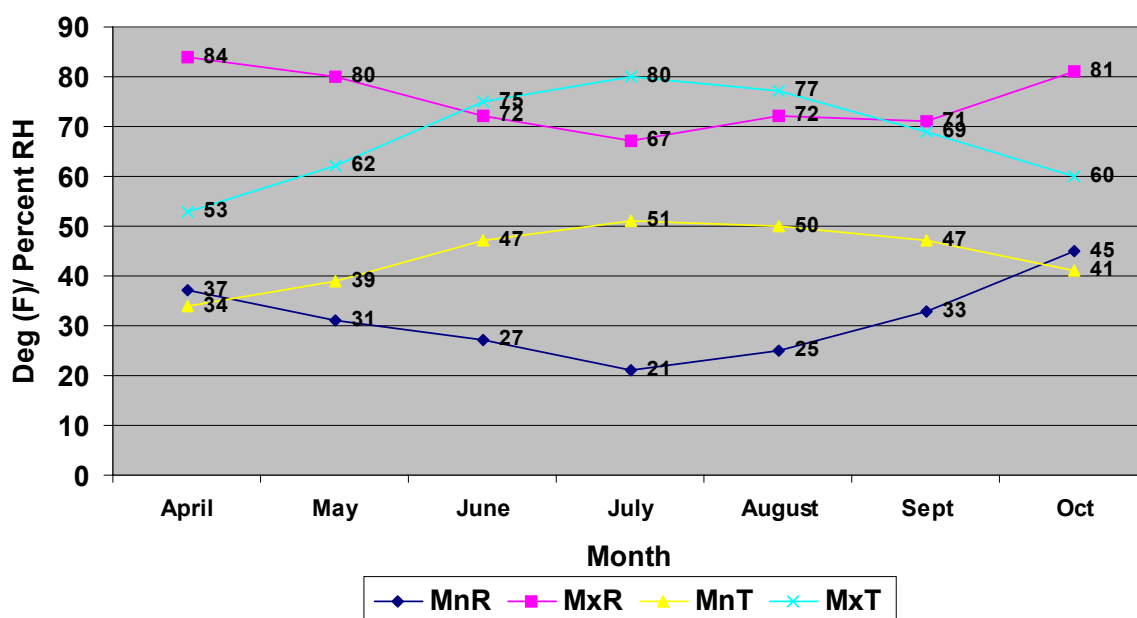
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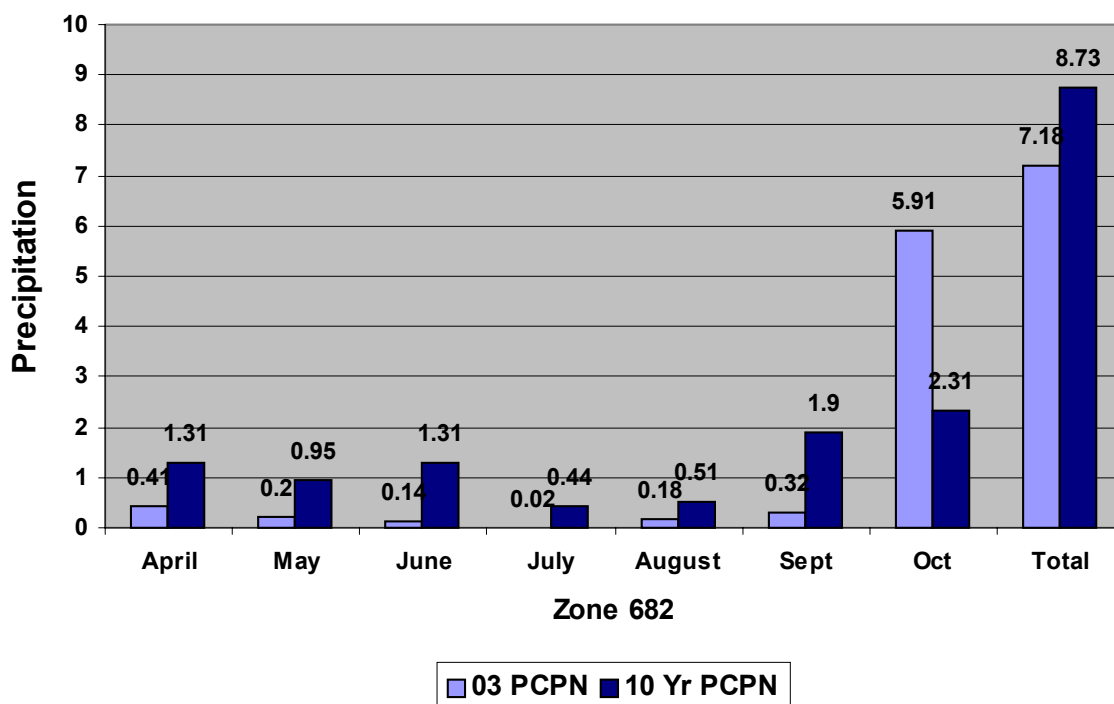
## 2003 Avg Pcpn/ 10 Yr Avg



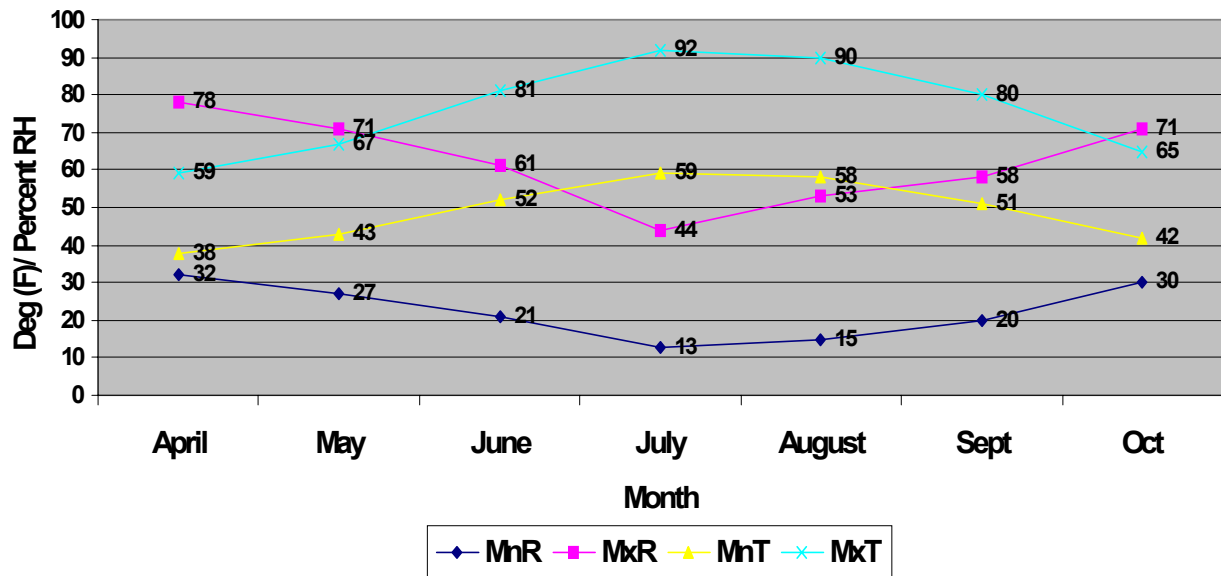
### 2003 Zone 682 Averages



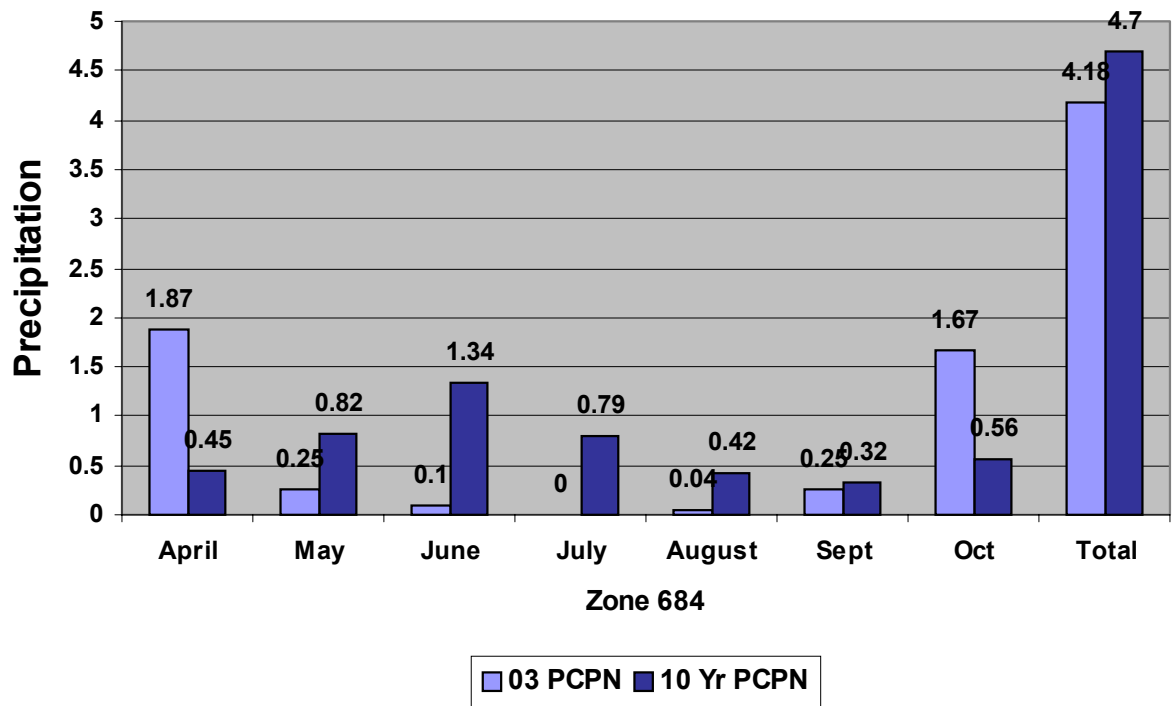
### 2003 Avg Pcpn/ 10 Yr Avg

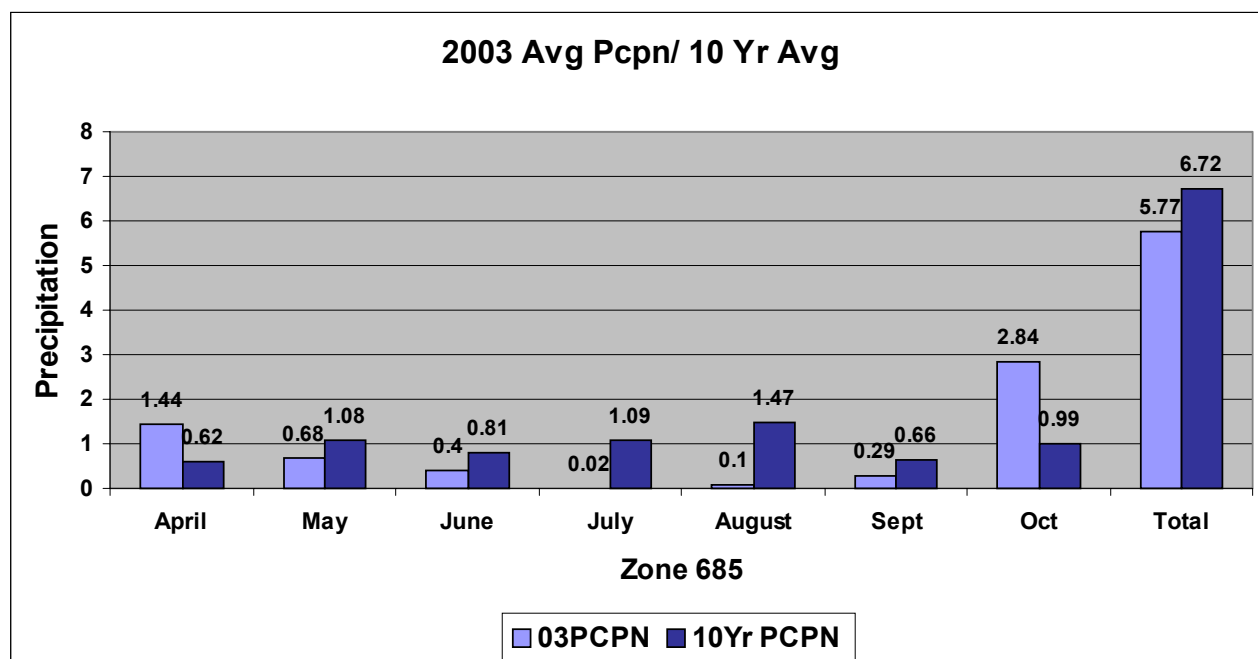
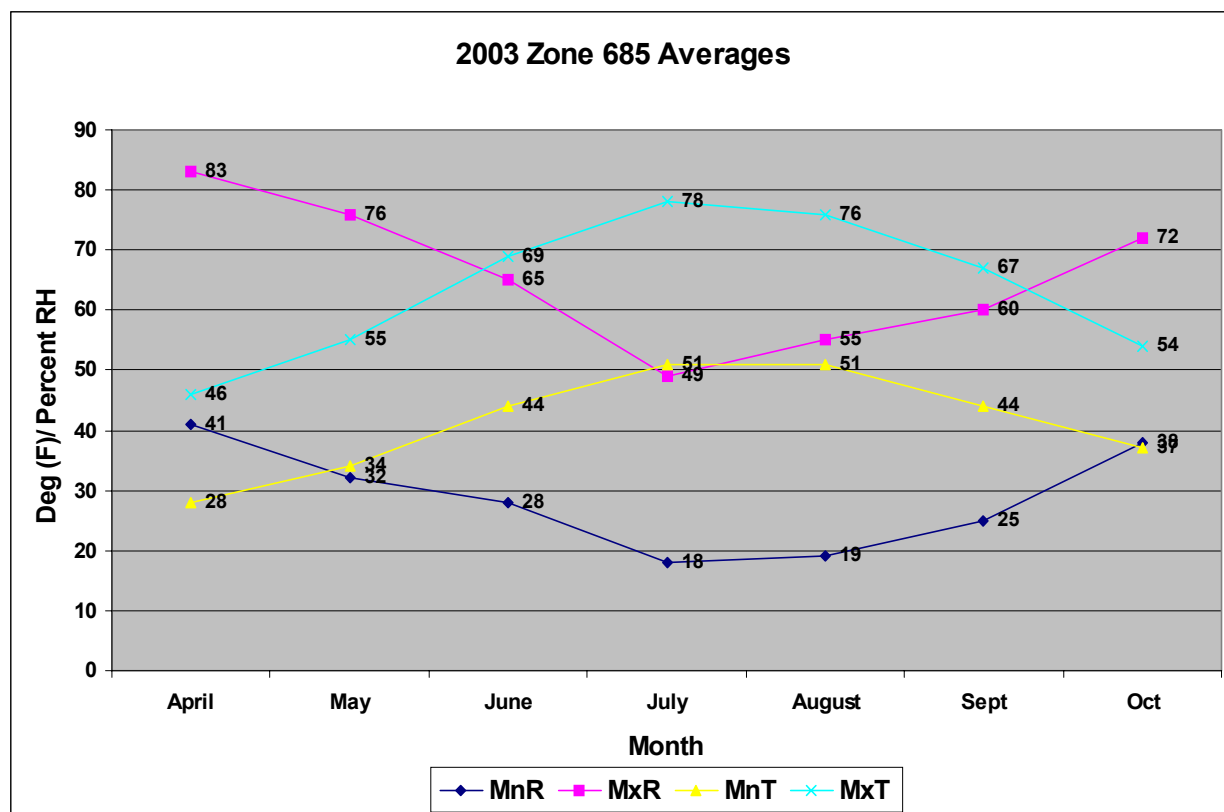


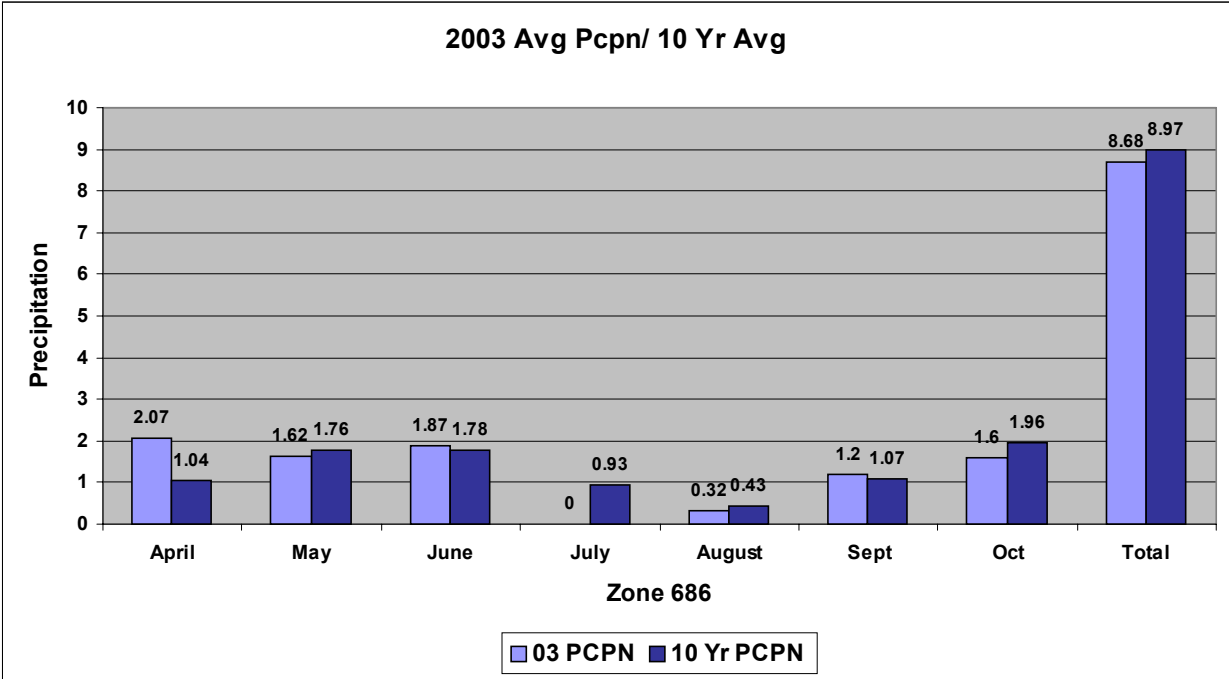
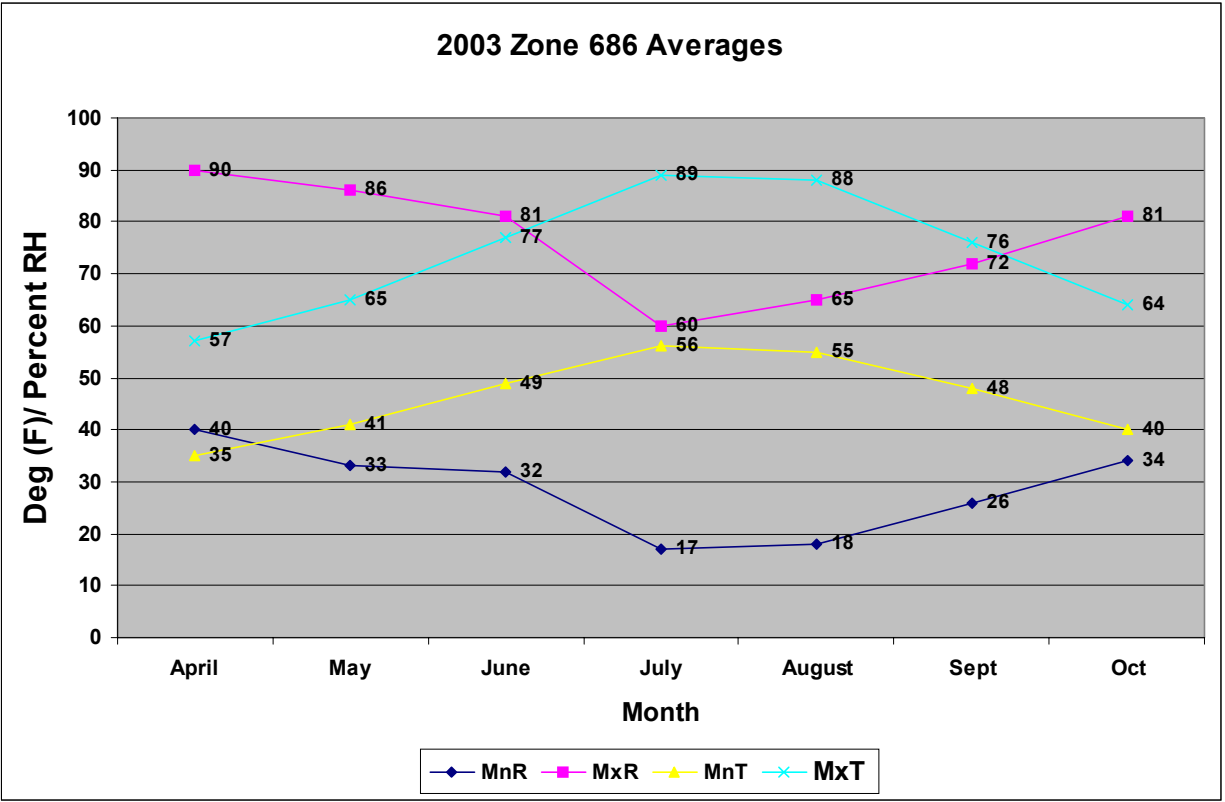
2003 Zone 684 Averages

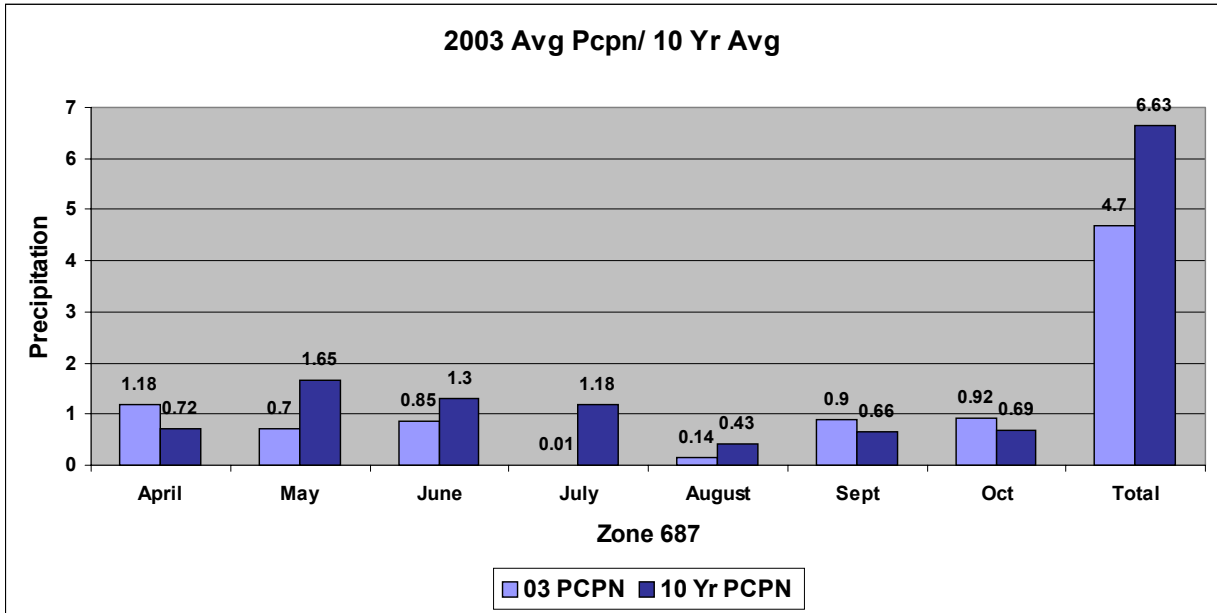
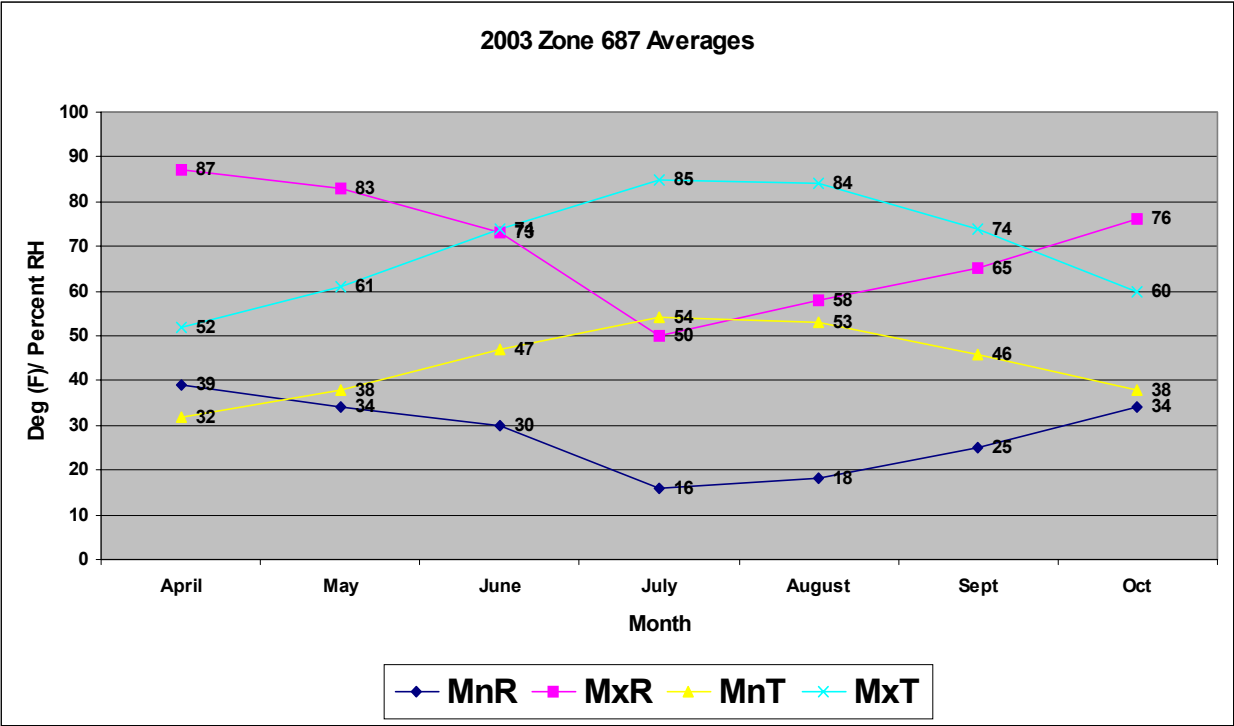


2003 Avg Pcpn/ 10 Yr avg











## 2003 Fire Season Fire Activity Summary

The total number of fires in eastern Washington and north Idaho in 2003 was slightly above the long term average and the number of lightning caused fires was also slightly above the long term average. While the total acres burned was above the long term average.

Below is a list of all fires over 100 acres listed in chronological order.

<b>June 9</b>	-	Sweetgrass Fire, 182 acres, OWF
<b>June 30</b>	-	Fawn Peak Fire, 81,343 acres, OWF
<b>June 30</b>	-	Nine Mile Fire, 1630 acres, JDF
<b>July 16</b>	-	Shooting Range Fire, 1391 acres, SPD
<b>July 20</b>	-	Watt Rd Fire, 1073 acres, JFQ
<b>June 25</b>	-	Hunt Creek Fire, 590 acres, IDL
<b>July 27</b>	-	Hatten Rd Fire, 7209 acres, SPD
<b>July 28</b>	-	Manastash Fire, 610 acres, SPD
<b>July 28</b>	-	Toboggan Fire, 350 acres, IPF
<b>July 30</b>	-	Flannigan Fire, 190 acres, IDL
<b>August 5</b>	-	Needles Fire, 21,300 acres, OWF
<b>August 5</b>	-	Bottle Springs II, 109 acres, OWF
<b>August 5</b>	-	The Butte Fire, 772 acres, OWF
<b>August 6</b>	-	Juniper Dunes, 5200 acres, SPD
<b>August 6</b>	-	Chelan Butte, 548 acres, SPD
<b>August 8</b>	-	Square Lake, 1097 acres, OWF
<b>August 10</b>	-	Black canyon Fire, 2870 acres, SPD, JIT
<b>August 12</b>	-	Cedonia North Fire, 850 acres, JIW
<b>August 21</b>	-	Wilcox Mtn, 400 acres, OWF

**September 2** - Myrtle Creek Fire, 3600 acres, IPF

**September 5** - Maple 2, 2409 acres, OWF

**September 5** - Bulldog Fire, 411 acres, JLC

**September 8** - Isabel Fire, 4535 acres, OWF

**September 21** - Crystal Fire, 1300 acres, OWF

### Fire Data of User Agencies - 2003

Agency	Lightning Caused Fires	Acres Burned	Human Caused Fires	Acres Burned	Total Fires	Total Acres Burned
SE DNR	23	71	113	4246	136	4317
NE DNR	79	162	255	7284	334	7446
Colville IA	NA	NA	NA	NA	NA	NA
Okanogan- Wenatchee NF	72	111,978	60	1607	132	113,585
Colville NF	34	5550	11	10	45	5560
Idaho Panhandle	202	468	147	4808	349	5275
FWS	4	10	18	510	22	520
BLM	2	4658	7	5769	9	10427
<b>Total</b>	<b>416</b>	<b>122897</b>	<b>611</b>	<b>24234</b>	<b>1027</b>	<b>147130</b>

## Fire Data by Year: 1970-2003

Year	Total Fires	Lightning Caused Fires	Total Acres Burned
1970	1,303	488	<b>215,037</b>
1971	606	127	3,902
1972	747	253	2,111
1973	1,079	123	11,223
1974*	1,103	238	9,466
1975	953	337	4,807
1976	740	117	32,272
1977	983	591	16,342
1978	790	339	2,361
1979	1,263	446	17,090
1980	613	243	3,465
1981	930	482	16,894
1982	910	368	5,776
1983	595	176	2,453
1984	879	406	5,757
1985	1,112	355	71,488
1986	865	295	9,727
1987	1,057	348	18,214
1988	689	84	89,140
1989	1,088	399	14,259
1990	1,203	583	15,324
1991	1,080	430	47,928
1992	959	368	33,819
1993**	655	186	3,295
1994	1,433	648	<b>260,245</b>
1995	792	211	4,002
1996	739	205	35,375
1997	467	247	5,283
1998	969	439	50,943

1999	951	283	13,128
2000***	827	435	<b>259,024</b>
2001	953	507	<b>182,468</b>
2002	1,157	465	70,814
2003	1,027	416	<b>147,130</b>
* Colville NF not included in years prior to 1974 ** Spokane IA not included in years prior to 1993 ***Added Northern Idaho Panhandle District in 2000			

## 2003 WFO SPOKANE FIRE WEATHER WATCH/WARNING VERIFICATION RESULTS

Date	Watch	Warning	Zones	Event	Large Fire Potential	Verification
6/28-29	Yes	Yes	673, 676, 677, 684	Wind/RH	High	No to all - winds too light
7/03	Yes	No	673	Wind/RH	High	Cancelled
7/12	No	Yes	673, 684	Wind/RH	High	Missed Event
7/16	No	Yes	684, 685	Wind/RH	High	Yes 684, No 685
7/23	Yes	Yes	673, 676, 677, 680, 682, 684, 685, 686, 687, 101	Wind/RH	High	No to all/ winds too light 673, 680, 684 criteria only met at one station
7/30	No	Yes	676, 677, 680, 682, 684, 685	Wind/RH/Haines	High	Yes to all
8/5	No	Yes	676, 677, 680, 682, 684, 685, 687	Dry Ltg	High	Yes to 676, 677, 680, 682, 684, 685 No 687, Missed 686
8/15	Yes	Yes	686	Wind/RH/Ltg	High	Yes
8/15	No	Yes	673, 676, 677, 680, 684, 685, 687, 101	RH/Dry Ltg/Haines	High	Yes 673, 684, 685, 686, 687 No 676, 677, 680, 682
8/19	No	No	101	Ltg	High	Missed Event
8/26	No	No	684	Wind/RH	High	Missed Event
9/1	No	No	684	Wind/RH	High	Missed Event
9/6	No	Yes	686, 687, 101	Dry Ltg	High	Yes 687, 101 Sct Ltg No 686 - No Ltg
9/6	No	No	684	Dry Ltg	High	Missed Event

9/26	No	No	684	Wind/RH	High	Missed Event
10/18	No	Yes	684	Wind/RH	Mod	Yes - Tropo Fold Event

**POD** = Probability of Detection - Highest Accuracy = 1  
Correct Warnings/ (Correct Warnings + Missed Warnings)

**FAR** = False alarm Ratio - Highest Accuracy = 0  
Incorrect warnings/ Correct warnings + Incorrect Warnings

**CSI** = Critical Success Ration - Highest Accuracy = 1  
Correct Warnings/ (Correct Warnings + Incorrect Warnings + Missed Warnings)

### All Warnings

<b>All RFWs</b>	<b>673</b>	<b>676</b>	<b>677</b>	<b>680</b>	<b>682</b>	<b>684</b>	<b>685</b>	<b>686</b>	<b>687</b>	<b>101</b>	<b>All Zones</b>
Warnings	3	5	5	4	4	7	5	3	5	3	44
Verified Warnings	2	3	2	2	2	6	3	1	3	2	26
Unverified Warnings	1	2	3	2	2	1	2	2	2	1	18
Missed Events	1	0	0	0	0	5	0	1	0	1	8
Total Events	3	3	2	2	2	11	3	2	3	3	34
Lead Time (hours)	3	6	7	6	6	3	8	6	8	6	6
POD	0.67	1.00	1.00	1.00	1.00	0.55	1.00	0.50	1.00	0.67	0.76
FAR	0.33	0.40	0.60	0.50	0.50	0.14	0.40	0.67	0.40	0.33	0.41
CSI	0.50	1.00	0.40	0.50	0.50	0.50	0.60	0.25	0.60	0.50	0.50

### Warnings for Dry Lightning

<i>RFW for Dry Lightning</i>	673	676	677	680	682	684	685	686	687	101	<i>All Zones</i>
Warnings	1	2	2	2	2	2	2	2	3	1	19
Verified Warnings	1	1	1	1	1	2	2	1	2	1	13
Unverified Warnings	0	1	1	1	1	0	0	1	1	0	6
Missed Events	0	0	0	0	0	1	0	1	0	1	3
Total Events	1	1	1	1	1	3	2	2	2	2	16
Lead Time (hours)	11	9	12	10	10	8	12	6	11	4	9
POD	1.00	1.00	1.00	1.00	1.00	0.67	1.00	0.50	1.00	0.50	0.81
FAR	0.00	0.50	0.50	0.50	0.50	0.00	0.00	0.50	0.33	0.00	0.32
CSI	1.00	0.50	0.50	0.50	0.50	0.67	1.00	0.33	0.67	0.50	0.59

### Warnings for Low RH Combined with Wind or Haines

<i>RFW with Low RH</i>	673	676	677	680	682	684	685	686	687	101	<i>All Zones</i>
Warnings	2	3	3	2	2	5	3	1	2	2	25
Verified Warnings	1	2	1	1	1	4	1	0	1	1	13
Unverified Warnings	1	1	2	1	1	1	2	1	1	1	12
Missed Events	1	0	0	0	0	4	0	0	0	0	5
Total Events	2	2	1	1	1	8	1	0	1	1	18
Lead Time (hours)	5	5	1	1	1	2	1	1	1	11	3
POD	0.50	1.00	1.00	1.00	1.00	0.50	1.00	0.00	1.00	1.00	0.72
FAR	0.50	0.33	0.67	0.50	0.50	0.20	0.67	1.00	0.50	0.50	0.48
CSI	0.33	1.00	0.33	0.50	0.50	0.44	0.33	0.00	0.50	0.50	0.43

## OPERATIONAL SUMMARY OF THE 2003 FIRE SEASON

Eastern Washington and the Idaho Panhandle saw near or below average winter snow pack in the mountains, while most areas received normal to above normal precipitation from December 2002 through March 2003. The region then dried out very quickly. Temperatures were generally above normal throughout the year. For the winter and early spring, this is indicative of an El Nino pattern. The lack of low level snow pack allowed fuels to cure about three weeks ahead of normal.

Land Management Forecasts were issued once a day, five days a week, through the winter and early spring months. Fire Weather Forecast services began with full service support (forecasts issued twice daily, seven days a week) starting April 7<sup>th</sup>. Full service forecast support continued until November 8<sup>th</sup>. Land Management Forecasts support commenced on November 11<sup>th</sup>. Land Management Forecasts again were issued once a day as a planning guide for land management agencies through the winter months.

This season, WFO Spokane Fire Weather Program issued a total of 491 spot forecasts for management planned activities and wild fires. This spot forecast total is down from 603 in 2002 and most likely reflects how quickly the region quickly transformed to an active fire season.

The Internet spot forecast request system continued to offer land management agencies rapid turn-around for their spot requests. The rapid response time allowed for more spot forecasts to be processed.

WFO Spokane again hosted an internet briefing daily through the peak fire season. This was an excellent opportunity for the weather forecasters to share their thoughts with the land managers and receive feedback of forecasts.

<b>IMET &amp; Dates Dispatched</b>	<b>Incident Name and Location</b>	<b>Incident Team</b>
Rocco Pellati 5/19-23/03	Methow RX Burn- Winthrop WA	
Rocco Pellati 6/30-7/7/03	Davis Fire - Link Fire Oregon Cascades	Hoff-Morcom
Bob Tobin	Link Fire - Metolius OR	Morcom
Jim Prange 7/5-18/03	Fawn Peak Fire - NE Mazama WA	Jennings-Lohrey
Rocco Pelatti 7/17-31/03	Fawn Peak Fire Zone 2 - NE Mazama WA	Lohrey-Furlong-Gormley
Bob Tobin/Joe Ramey (T) 7/22-8/5/03	Fawn Peak Fire Zone 1 - Tonasket WA	Anderson
Joe Solomon/Andy Haner (T) 8/5-15/03	Fawn Peak Fire Zone 1 - Tonasket WA	Lohrey
Rocco Pellati 8/11-25/03	Beaver Lake Fire - Missoula MT	Frye
John Saltenberger 8/13-22/03	Black Canyon Fire - Northport WA	Halloway-Reed
Todd Carter 8/20-28/03	Togo Mtn Fire- Curlew WA	Jennings/Perry
Bob Tobin 8/25-9/9/03	Robert Fire - Columbia Falls MT	Ferguson-Cable
Joe Solomon 9/5-19/03	Needles Fire - Mazama WA	Berndt
Rocco Pellati 9/7-15/03	Robert Fire - Columbia Falls MT	Cable
Makota Moore 9/8-16/03	Maple Fire - Chelan WA	Halloway-Reed
Tom Wright 9/8-16/03	Myrtle Creek Fire - Bonners Ferry ID	Frye
Todd Carter 9/11-20/03	Mineral Primm Fire - Missoula MT	Broyles-Larsen
Dave Lipson 9/19-10/1/03	Needles Fire - Mazama WA	Furlong
Gary Bennett 10/2-10/03	Needles Fire - Mazama WA	Halloway-Reed
Mike Stavish 10/3-11/03	Isabel Fire - Conconully	Johnson-Barnett-Anderson